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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/753,614

01/08/2004

Thomas E. Owen

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EXAMINER

HANNAHER, CONSTANTINE

ART UNIT

PAPER NUMBER

2878

DATE MAILED: 08/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/753,614

Applicant(s)

OWEN, THOMAS E.

Examiner

Constantine Hannaher

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 20040709.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: page 10, line 9, the reference to the second view should be to the first view (since it is the embodiment of Fig. 1 that is most fairly described as split).

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The formulation “sensitive to a wavelength known to attenuate radiation transmitted through the subject gas” and the like in independent claims 1 and 18 and in dependent claims 8, 10, 11, 21, 23, and 24 is unclear as it is not fair to describe filters as having a sensitivity and furthermore wavelengths don’t attenuate radiation. The claims have been interpreted as if the claims read “a... filter... and passing a wavelength of radiation known to be attenuated by transmission through the subject gas” and the like. The balance of the claims is rejected on the basis of their dependence.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 4, 7, 13-15, 18, 19, and 25 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Hempowitz *et al.* (US003940623A).

With respect to independent claim 1, Hempowitz *et al.* discloses a sensor (Fig. 1) for detecting an infrared absorbing subject gas in a gas mixture which comprises a sensor chamber 5, an infrared radiation source 2, a first filter 9a, a second filter 9b, a chopper 10, and an infrared detector 13. See column 2, line 41 to column 3, line 25.

With respect to dependent claim 4, the filters 9a, 9b and the chopper 10 in the sensor of Hempowitz *et al.* have a split geometry of the type recited.

With respect to dependent claim 7, the filters 9a, 9b in the sensor of Hempowitz *et al.* are equidistant from source 2.

With respect to dependent claim 13, the sensor of Hempowitz *et al.* further comprises a collimating lens 4 with the recited function.

With respect to dependent claim 14, the sensor of Hempowitz *et al.* further comprises a focusing lens 12 with the recited function.

With respect to dependent claim 15, the filters 9a, 9b in the sensor of Hempowitz *et al.* each receive a half portion of the infrared beam (Fig. 1).

With respect to independent claim 18, Hempowitz *et al.* discloses a method of detecting an infrared absorbing subject gas in a gas mixture corresponding to the illustrated sensor (Fig. 1) which would comprise the steps of generating a beam of infrared radiation with a light source 2, filtering a first portion of the beam using a first filter 9a, filtering a second portion of the beam using a second filter 9b, wherein the filters are equidistant from source 2 (Fig. 1), using a chopper 10, and detecting radiation with an infrared detector 13. See column 2, line 41 to column 3, line 25.

With respect to dependent claim 19, the filters **9a**, **9b** and the chopper **10** in the method of Hempowitz *et al.* have a split geometry of the type recited.

With respect to dependent claim 25, the filters **9a**, **9b** in the sensor of Hempowitz *et al.* each receive a half portion of the infrared beam (Fig. 1).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2, 3, 8-12, and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hempowitz *et al.* (US003940623A).

With respect to dependent claims 2 and 3, it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose a cross section for chamber **5** in the sensor of Hempowitz *et al.* to have any regular proportion suitable for manufacture, gas flow, and infrared transmission.

With respect to dependent claims 8-11, although Hempowitz *et al.* suggests wavelengths suitable for analyzing HF, it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose wavelengths suitable for analyzing any particular gas or vapor in view of the improved applicability of the instrument for use.

With respect to dependent claim 12, although Hempowitz *et al.* suggests a halogen light source **2**, it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose an incandescent source as such are known as sources of infrared beams and may be

more cost-effective in applications.

With respect to dependent claims 21-24, although Hempowitz *et al.* suggests wavelengths suitable for analyzing HF, it would have been obvious to one of ordinary skill in the art at the time the invention was made to choose wavelengths suitable for analyzing any particular gas or vapor in view of the improved applicability of the instrument for use.

8. Claims 5, 6, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hempowitz *et al.* (US003940623A) in view of Gallorini *et al.* (US005552841A).

With respect to dependent claim 5, although the filters **9a**, **9b** and chopper **10** in the sensor of Hempowitz *et al.* have a split geometry, a relationship of inner and outer portions is not illustrated. Gallorini *et al.* shows that a chopper with inner and outer portions (column 4, lines 36-41) is known. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the sensor of Hempowitz *et al.* to arrange the filters **9a**, **9b** and chopper **10** to have inner and outer portions as suggested by Gallorini *et al.* in view of the improved adjustment of region size made possible thereby.

With respect to dependent claim 6, the relation of inner portion to outer portion in the suggestion of Gallorini *et al.* is annular.

With respect to dependent claim 20, although the filters **9a**, **9b** and chopper **10** in the sensor of Hempowitz *et al.* have a split geometry, an annular relationship is not illustrated. Gallorini *et al.* shows that a chopper with annularly arranged inner and outer portions (column 4, lines 36-41) is known. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the sensor of Hempowitz *et al.* to arrange the filters **9a**, **9b** and chopper **10** to have inner and outer portions as suggested by Gallorini *et al.* in view of the improved adjustment of region size made possible thereby.

9. Claims 16 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hempowitz *et al.* (US003940623A) in view of Yaegashi (JP 9-264790 A).

With respect to dependent claim 16, the chopper **10** in the sensor of Hempowitz *et al.* is a mechanical device, but Yaegashi shows that a liquid crystal device for chopping infrared radiation passed to an infrared detector is known (see Fig. **4** and liquid crystal shutter **401** and bolometer **405**). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the sensor of Hempowitz *et al.* to replace the mechanical chopper **10** with at least one liquid crystal device as suggested by Yaegashi in view of the advantageous elimination of a moving part.

With respect to dependent claim 26, the chopper **10** in the method of Hempowitz *et al.* is a mechanical device, but Yaegashi shows that a liquid crystal device for chopping infrared radiation passed to an infrared detector is known (see Fig. **4** and liquid crystal shutter **401** and bolometer **405**). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Hempowitz *et al.* to replace the use of a mechanical chopper **10** with the use of at least one liquid crystal device as suggested by Yaegashi in view of the advantageous elimination of a moving part.

10. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hempowitz *et al.* (US003940623A) in view of Yaegashi (JP 9-264790 A) and Gallorini *et al.* (US005552841A).

With respect to dependent claim 17, the chopper **10** in the sensor of Hempowitz *et al.* is a mechanical device, but Yaegashi shows that a liquid crystal device for chopping infrared radiation passed to an infrared detector is known (see Fig. **4** and liquid crystal shutter **401** and bolometer **405**). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the sensor of Hempowitz *et al.* to replace the mechanical chopper **10** with a single liquid crystal device as suggested by Yaegashi in view of the advantageous elimination of a moving part.

Independently operable areas is a routine feature of single liquid crystal devices, as shown by Gallorini *et al.*, so it would have been obvious to one of ordinary skill in the art at the time the invention was made to specify a single liquid crystal device with independently operable areas in view of the improved adjustment of region size made possible thereby.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Tomita (US005436457A) shows that integration of the source at the end of the chamber is known.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Constantine Hannaher whose telephone number is (571) 272-2437. The examiner can normally be reached on Monday-Friday with flexible hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Constantine Hannaher
Primary Examiner